1. An apparatus for thermocycling a reaction mixture in a continuous flow comprising:

a lateral flow device having proximal and distal ends, wherein said lateral flow device comprises

(a) a sample reservoir located at said proximal end of said lateral flow device;

(b) a wicking pad located at said distal end of said lateral flow device; and

(c) a porous membrane located between and contacting said sample reservoir and said wicking pad; and

an instrument for receiving said lateral flow device comprising a temperature block comprising a plurality of stationary thermal zones, said temperature block arranged to fit between said sample reservoir and said wicking pad and in contact with said porous membrane.

2. The apparatus of claim 1, wherein the lateral flow device is disposable.

3. The apparatus of claim 1, wherein said porous membrane comprises a proximal amplification zone and a distal detection zone.

4. The apparatus of claim 1, wherein said stationary thermal zone comprises a plurality of thermally conductive bars, a plurality of heaters, and a plurality of temperature controllers.

5. The apparatus of claim 4, wherein each of said thermally conductive

bars contains a plurality of teeth.

6. The apparatus of claim 5, wherein said teeth are interdigitated and do not contact each other.

7. The apparatus of claim 4, wherein each of said thermally conductive bars is a different reaction temperature.

8. The apparatus of claim 4, wherein said thermally conductive bars comprise a melting bar, an extension bar, and an annealing bar.

9. The apparatus of claim 8, wherein said thermally conductive bars are arranged at 0°, 90°, and 180°, with respect to each other.

10. The apparatus of claim 1, further comprising an insulating cover that presses said porous membrane against said stationary thermal zones of said lateral flow device.

11. The apparatus of claim 1, further comprising a means for sealing said lateral flow device within said instrument.

12. The apparatus of claim 3, wherein said detection zone comprises a test line zone, wherein said test line zone is located distal to said amplification zone.

13. The apparatus of claim 3, wherein said detection zone comprises a

test line zone and a control line zone, wherein said test line zone is located distal to said amplification zone and said control line zone is located distal to said test line zone.

14. The apparatus of claim 3, wherein said detection zone comprises a labeling zone and a test line zone, wherein said labeling zone is located on said porous membrane distal to said amplification zone, and wherein said test line zone is located distal to said labeling zone.

15. The apparatus of claim 3, wherein said detection zone comprises a labeling zone, a test line zone, and a control line zone, wherein said labeling zone is located distal to said amplification zone, wherein said test line zone is located distal to said labeling zone, and wherein said control line zone is located distal to said test line zone.

16. The apparatus of claim 12, 13, 14, or 15 wherein said test line zone comprises a linear array of an amplicon-capturing agent on said porous membrane.

17. The apparatus of claim 13 or 15, wherein said control line zone comprises a linear array of a probe-capturing agent on said porous membrane.

18. The apparatus of claim 14 or 15, wherein said labeling zone comprises an amplicon-specific probe on said porous membrane.

19. The apparatus of claim 3, wherein said detection zone further comprises a second temperature block comprising at least one stationary thermal

zone.

20. A method for amplifying nucleic acid comprising,

applying a nucleic acid amplification reaction mixture to the proximal end of a porous membrane; and

allowing said reaction mixture to travel toward the distal end of said porous membrane, wherein said reaction mixture travels through a plurality of proximal stationary thermal zones in contact with said porous membrane.

21. The method of claim 20, further comprising concentrating and detecting said nucleic acid, said concentrating and detecting comprising allowing said reaction mixture to travel through a distal detection zone on said porous membrane.

22. The method of claim 21, wherein said concentrating and detecting further comprise allowing said nucleic acid to travel through a test line zone located within said detection zone, said test line zone comprising a linear array of amplicon-capturing agents on said porous membrane.

23. The method of claim 22, wherein said concentrating and detecting further comprise allowing said nucleic acid to travel through a control line zone located within said detection zone distal to said test line zone, said control line zone comprising a linear array of a probe-capturing agent on said porous membrane.

24. The method of claim 22 or 23, wherein said concentrating and

detecting further comprise allowing said nucleic acid to travel through a labeling zone located between said amplification zone and said test line zone, said labeling zone comprising amplicon-specific probes on said porous membrane.

25. The method of claim 20, further comprising assaying said porous membrane for the presence of said probe in said detection zone, the presence of said probe indicating successful amplification of said nucleic acid.

26. A method for amplifying nucleic acid using the apparatus of claim 1, said method comprising,

applying a nucleic acid amplification mixture to said sample reservoir; and

allowing said nucleic acid to travel through said amplification zone.

27. The method of claim 26, further comprising concentrating and detecting said nucleic acid, said concentrating and detecting comprising, allowing said nucleic acid to travel through said detection zone.

28. The method of claim 26, further comprising assaying said porous membrane for the presence of said probe in said detection zone, the presence of said probe indicating successful amplification of said nucleic acid.